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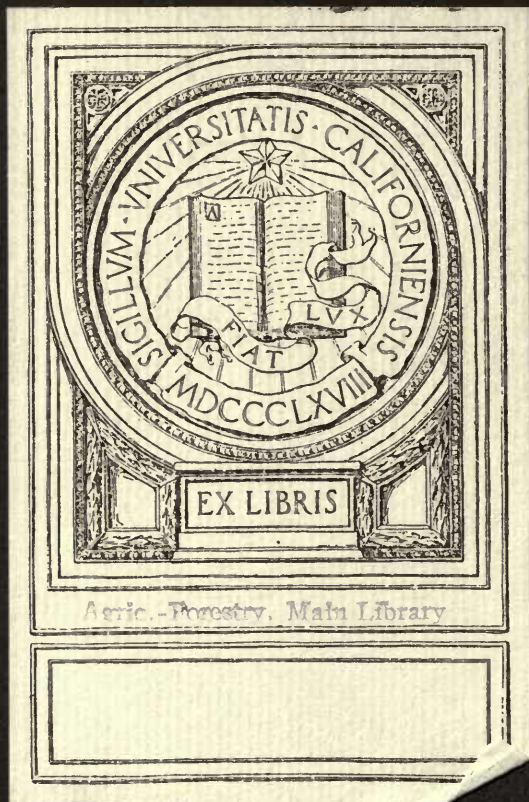
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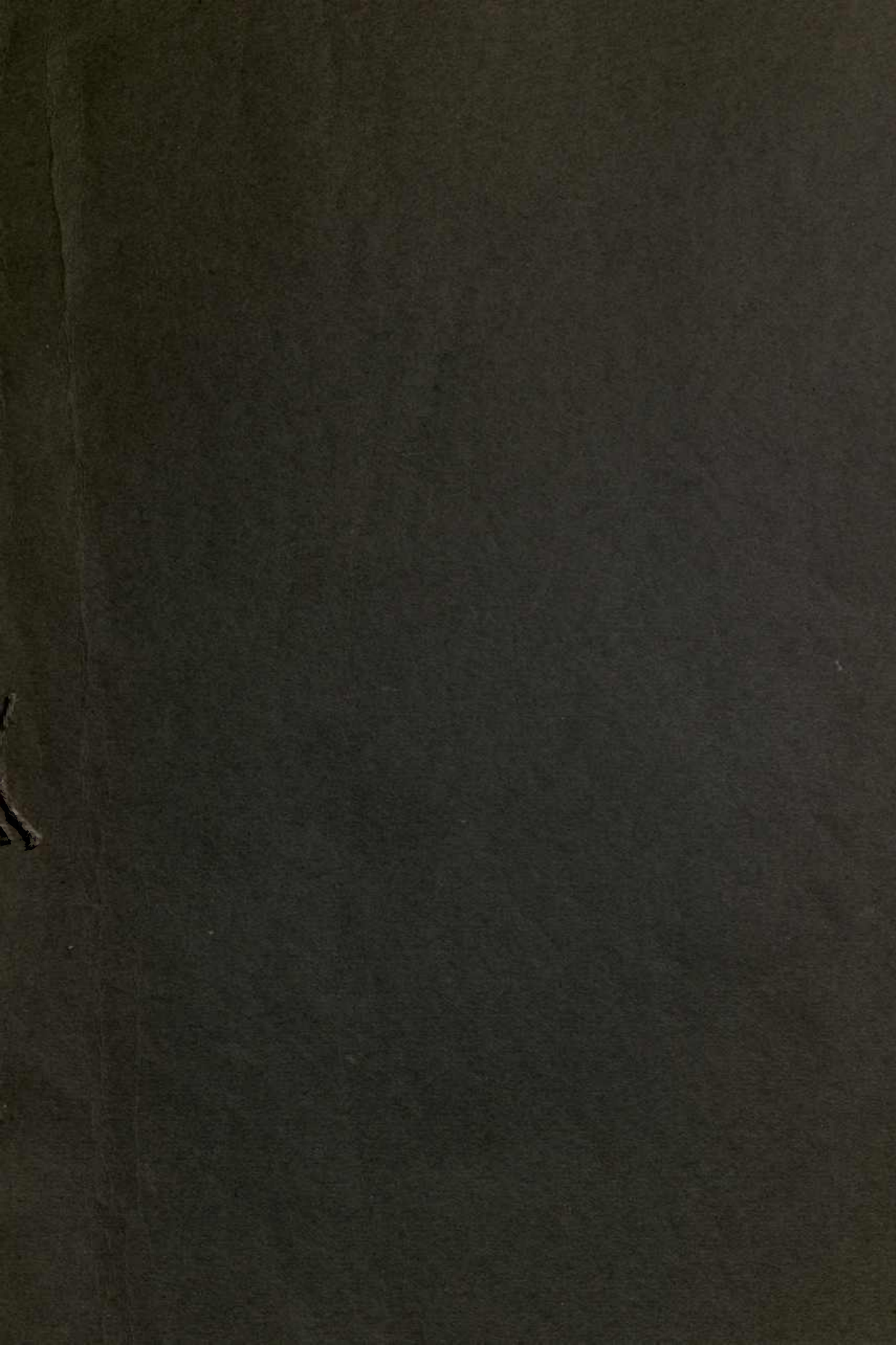
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THE SEASONING AND PRESERVATIVE TREAT-  
MENT OF WESTERN RED CEDAR  
O. T. Swan

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## WESTERN RED CEDAR.

### THE SEASONING OF CEDAR.

#### THE SEASONING AND PRESERVATIVE TREATMENT

OF

WESTERN RED CEDAR

by

O. T. Swan

Chief of Products - District 3

April, 1909.

U. S. DEPARTMENT OF AGRICULTURE  
FOREST SERVICE

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## THE SEASONING AND PRESERVATIVE TREATMENT

Cedar poles used in Los Angeles, are cut in the

State of Washington, WESTERN RED CEDAR. and after but

little seasoning and after a period in the water of the

Sound are transported THE SEASONING OF CEDAR. ports. For

these experiments poles were cut each season. Some of the  
Object of Seasoning Tests.

poles were weighed at the place of lumbering in order to

obtain Preservative treatments cannot be successfully season's

applied until poles are seasoned to a certain point which the

will permit of good absorption of the preserving solution

or oil. It is important to know just what this point is poles

for any species, and it is even more important to know

just how long poles seasoning under the varied condition of the

of winter, summer, fall and spring will severally require

to reach this stage. seasoned appreciably faster and the

Figure Briefly stated the aim of seasoning experiments is: used

1. To obtain figures covering the monthly

rate of loss of weight of poles seasoned at any period. in

order 2. In connection with the treating tests to hold

discover the stage of seasoning at which preservative treat-

ments are successful. serve as a basis in estimating any

additional seasoning charges incurred in preparing poles

for treatment and after the establishment of a pole treating

policy will enable the work to be planned ahead through the

ability to know the seasoning stage of poles at any time.

12/29/20

# THE SEASONING AND PRESERVATIVE TREATMENT

OF

WESTERN RED CEDAR.

## THE SEASONING OF CEDAR.

Object of Seasoning Tests.

Preservative treatments cannot be successfully applied until poles are seasoned to a certain point which will permit of good absorption of the preservative solution or oil. It is important to know just what this point is for any species, and it is even more important to know just how long poles season under the various conditions of winter, summer, fall and spring will eventually reduce to reach this state.

Briefly stated the aim of seasoning experiments is:

1. To obtain figures covering the monthly rate of loss of weight of poles seasoned at any period.

2. In connection with the seasoning tests to

discover the stage of seasoning at which preservative treat-

ments are successful.



## Loss of Weight in Seasoning.

Cedar poles used in Los Angeles, are cut in the State of Washington, hauled to Puget Sound after but little seasoning and after a period in the water of the Sound are transported by boat to Los Angeles ports. For these experiments poles were cut each season. Some of the poles were weighed at the place of lumbering in order to obtain the green weight. One hundred poles of each season's cut were weighed from time to time after their arrival at the yards of the Edison Electric Company in Wilmington. The poles were seasoned on the usual skids consisting of two pole placed directly on the ground for skid poles upon which the poles to be seasoned were rolled in but one tier. If the skid poles had been raised from the ground by cross logs the poles would have seasoned appreciably faster and the figures tabulated in this report can accordingly be surpassed. The results represent the present and usual practice.

A study of the seasoning of cedar is important in order to foretell the time it will be necessary to hold poles before they are dry enough for preservative treatment. This knowledge will serve as a basis in estimating any additional seasoning charges incurred in preparing poles for treatment and after the establishment of a pole treating policy will enable the work to be planned ahead through the ability to know the seasoning stage of poles at any time.

Loss of Weight in Seasoning.

Cedar poles used in Los Angeles are cut in the State of Washington, hauled to Puget Sound after but little seasoning and after a period in the water at the Sound are transported by boat to Los Angeles ports. For these experiments poles were cut each season. Some of the poles were weighed at the place of lumbering in order to obtain the green weight. One hundred poles of each season's cut were weighed from time to time after their arrival at the yards of the Edison Electric Company in Wilmington. The poles were seasoned on the usual skids consisting of two poles placed directly on the ground for skid poles upon which the poles to be seasoned were rolled in but one tier. If the skid poles had been raised from the ground by cross logs the poles would have seasoned appreciably faster and the figures tabulated in this report can accordingly be surpassed. The results represent the present and usual practice. A study of the seasoning of cedar is important in order to foretell the time it will be necessary to hold poles before they are dry enough for preservative treatment. This knowledge will serve as a basis in estimating any additional seasoning charges incurred in preparing poles for treatment and after the establishment of a pole seasoning policy will enable the work to be planned ahead through the



# SEASONING OF WESTERN RED CEDAR POLES

LOS ANGELES, CALIFORNIA.

WEIGHT PER CUBIC FOOT <sup>447</sup>  
Each Month from Time of Cutting.

The following table shows the weight of the poles per cubic foot at the time of cutting, at the time of arrival in Wilmington, California, and monthly thereafter. The figures will also closely represent conditions in San Francisco.

			42.4 #	
Nov.				
Dec.			42.4 #	
Jan.	32.5 ##			
Feb.	31.1			
Mar.	30.0			
Apr.	28.5		36.12 ##	42.4 #
May	26.5	35	28.25	
June	25.0	29	26.30	
July	23.5	25.5	25.3	38.12 ##
Aug.	23.45	25.5		35
Sept.				31
Oct.				29.3
Nov.				28.0

-3-

## The average volume of 500 poles (40'-8") was 21.33 cubic feet.

# Absolute green weight.

## Weight on arrival at Los Angeles, California, three to seven months after cutting.

The following table shows the weight of the poles  
per cubic foot at the time of cutting, at the time of  
arrival in Wilmington, California, and monthly thereafter.  
The figures will also closely represent conditions in San  
Francisco.



# SEASONING OF WESTERN RED CEDAR POLES

## LOS ANGELES, CALIFORNIA.

It will be noticed that the green weight of cedar is

42.4 pounds per cubic foot and that from five to ten pounds of

this weight is **WEIGHT PER CUBIC FOOT ###**  
Each Month from Time of Cutting. Los Angeles.

The ~~win~~ Summer Cut ~~ss~~ Fall Cut ~~the~~ Winter Cut ~~po~~ Spring Cut

July and 42.4 # Los Angeles in unusually short periods of

Aug. cutting. The weight of the latter poles is therefore high-

Sept. an it would be under average conditions.

Oct. Everything comes 42.4 # it is believed that poles will

Nov. ly arrive in Los Angeles weighing about 33 pounds per

Dec. a foot and this figure is there 42.4 # as the basis of

Jan. 4 on 32.5 ##

Feb. It s 31.1 be stated here that rains or soaking

Mar. ater de 30.0 seasoning approximately only during the period

Apr. as rains 28.5 the soaking and 36.12 ## ater 42.4 # at

May time 26.5 at with 33 great rapid 28.25 did not at the usual

June season 25.0 ate, 29 before is 26.30 es are seasoned nigh

July of the 23.5 e int 26.5 Sound 25.3 ater taken 38.12 ## kin

Aug. out ray 23.46 until 25.5 poles reach the point a 33 high

Sept. r seasoning stopped. 31

Oct. The poles season regularly until they weigh 29.3

Nov. 25 pounds per cubic foot. At this point in 28.0 evapora-

tion of water from the poles proceeds very slowly. They are

### The average volume of 300 poles (40'-8") was  
27.34 cubic feet.

# Absolute green weight.

## Weight on arrival at Los Angeles, California. From  
three to seven months after cutting.



# SEASONING OF WESTERN RED CEDAR POLES

LOS ANGELES, CALIFORNIA

WRIGHT PER CUBIC FOOT #11  
Each Month from Time of Cutting.

Summer Cut Fall Cut Winter Cut Spring Cut

July	42.4 #			
Aug.				
Sept.				
Oct.	42.4 #			
Nov.				
Dec.				
Jan.	32.2 #			
Feb.	31.1 #			
Mar.	30.0 #			
Apr.	28.2 #			
May	26.2 #	33		
June	25.0 #	32		
July	23.2 #	29.2		
Aug.	23.42	27.2		
Sept.				
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It will be noticed that the green weight of cedar is 42.4 pounds per cubic foot and that from five to ten pounds of this weight is evaporated before the poles reach Los Angeles. The winter-cut and especially the spring-cut poles were rushed and reached Los Angeles in unusually short periods after cutting. The weight of the latter poles is therefore higher than it would be under average conditions.

Everything considered it is believed that poles will usually arrive in Los Angeles weighing about 33 pounds per cubic foot and this figure is therefore made the basis of Table 4 on page 11.

It should be stated here that rains or soaking in water delay seasoning approximately only during the period of the rain or of the soaking and that the water taken up at such times is lost with great rapidity and not at the usual slow seasoning rate. Therefore if poles are seasoned slightly and then thrown into the Sound the water taken up in soaking is lost rapidly until the poles reach the point at which regular seasoning stopped.

The poles season regularly until they weigh but 23 to 25 pounds per cubic foot. At this point further evaporation of water from the pole proceeds very slowly. They are then nearly air dry and fit for any preservative treatment.

It will be noticed that the green weight of cedar is 4 pounds per cubic foot and that from five to ten pounds of its weight is evaporated before the poles reach Los Angeles. The water content and especially the sap content poles were tested and weighed in Los Angeles in numerous short periods of an hour. The weight of the faster poles is therefore less than it would be under average conditions. Everything considered it is believed that poles will mainly arrive in Los Angeles weighing about 55 pounds per cubic foot and this figure is therefore made the basis of pole 4 on page 11. It should be stated here that tests of soaking water delay sections approximately only during the period the rain or of the soaking and that the water taken up at each time is lost with great rapidity and not at the same slow seeping rate. Therefore as it poles are soaked slightly and then through into the ground the water taken up in soaking is lost rapidly until the poles reach the point at which regular seeping begins. The poles season rapidly until they weigh but 55 pounds per cubic foot. At this point further evaporation of water from the pole proceeds very slowly. They are then nearly air dry and fit for any preservative treatment.



Table 2.

## FREIGHT TABLE.

AMOUNT OF UNEVAPORATED WATER  
BEING HANDLED PER POLE. #

	Summer Cut Pounds	Fall Cut Pounds	Winter Cut Pounds	Spring Cut Pounds
Jan.	259.9 #			
Feb.	221.7			
Mar.	192.5			
Apr.	150.6		353.6	530.4
May	95.5	273.7 #	143.7	
June	94.6	159.7	90.2	
July	13.8	95.5	63.1	413.2 #
Aug.	18.7	68.4		273.2
Sept.				218.5
Oct.				172.3
Nov.				138.8

X - At time of cutting.

Y - Average 40'-8" cedar pole contained 27.54 cubic feet and assuming that the weight of 27.54 pounds per cubic foot of green wood is 113.8 pounds per pole. The green weight of the average cedar pole is 1138.2.

Z - At time of arrival in Los Angeles.



Poles which arrive in Los Angeles too late  
to become air dry before winter do not reach that condition  
until the following spring because there is but little  
seasoning during the rainy winter weather.



Table 2.

## FREIGHT TABLE.

AMOUNT OF UNEVAPORATED WATER  
BEING HANDLED PER POLE. #

	Summer Cut Pounds	Fall Cut Pounds	Winter Cut Pounds	Spring Cut Pounds
July	530.4 X			
Aug.				
Sept.				
Oct.		530.4 X		
Nov.				
Dec.			530.4 X	
Jan.	259.9 ##			
Feb.	221.7			
Mar.	191.5			
Apr.	150.6		358.6	530.4
May	95.5	273.7##	143.7	
June	54.6	159.7	90.2	
July	13.8	95.5	63.1	413.2##
Aug.	12.7	68.4		273.2
Sept.				218.5
Oct.				172.3
Nov.				138.8

X - At time of cutting.

# - Average 40'-8" cedar pole contained 27.34 cubic feet and seasons down to a weight of 23 pounds per cubic foot or 628.8 pounds per pole. The green weight of the average cedar pole is 1159.2.

## - At time of arrival in Los Angeles.



## - At time of arrival in Los Angeles.

152.2. # - Average 40'-8" cedar pole contained 27.34 cubic feet season down to a weight of 25 pounds per cubic foot or 8 pounds per pole. The green weight of the average cedar pole.

K - At time of cutting.

138.8

172.3

218.5

273.2

415.24

20.5

143.7

328.0

230.4

12.7

13.8

24.0

22.7

170.0

191.2

221.7

222.9

230.4 K

230.4 K

230.4 K

Summer Cut  
Pounds

Fall Cut  
Pounds

Winter Cut  
Pounds

Spring Cut  
Pounds

AMOUNT OF UNSEASONED WATER  
BRING INSTEAD PER POLE. #

FREIGHT TABLE.

Table 2.



# SEASONING OF WESTERN RED CEDAR POLES

## LOS ANGELES, CALIFORNIA.

### STAGE OF SEASONING #

Table 2 given an exact idea of the excess weight that was actually handled with each pole of these experiments. Under present methods it is apparent that each pole contains on an average about 275 pounds of unevaporated water on arrival at Los Angeles ports. This amounts to 20,000 pounds per carload of 80 poles.

To the consumer near the port this matters little because the freight rate on the vessel is based on volume but to the consumer of cedar in the interior as at Fresno, it is a matter of freight on 10 tons excess weight per carload or about 30 cents per pole.

# 25 pounds per cubic foot may be considered as the air weight of cedar poles. It is therefore taken as the seasoning stage of 100%. It should be noted that poles will season very slowly to below 25 pounds per cubic foot. The oven-dry weight of cedar is 18.2 pounds per cubic foot.

Preservative treatments may be applied when the poles are



Table 2 gives an exact idea of the excess weight that was actually handled with each pole of these experiments. Under present methods it is apparent that each pole contains on an average about 275 pounds of unevaporated water on arrival at Los Angeles ports. This amounts to 20,000 pounds per carload of 80 poles.

To the consumer near the port this matters little because the freight rate on the vessel is based on volume but to the consumer of cedar in the interior as at Fresno, it is a matter of freight on 10 tons excess weight per carload or about 50 cents per pole.



Table, 3.

# SEASONING OF WESTERN RED CEDAR POLES

## LOS ANGELES, CALIFORNIA.

## STAGE OF SEASONING #

	By Months			
	Summer Cut Per cent of Evaporable Water Evapor- ated	Fall Cut Per cent of Evaporable Water Evapor- ated	Winter Cut Per cent of Evaporable Water Evapor- ated	Spring Cut
July	00.			
Aug.				
Sept.				
Oct.		00.		
Nov.				
Dec.			00.	
Jan.	51.0			
Feb.	58.2			
Mar.	63.9			
Apr.	71.6		32.4	00.
May	82.0	48.4	72.9	
June	89.7	69.1	83.0	
July	97.4	82.0	88.1	22.1
Aug.	97.6	87.1		48.5
Sept.				58.8
Oct.				67.5
Nov.				74.2

# 23 pounds per cubic foot may be considered as the air dry weight of cedar poles. It is therefore taken as the seasoning stage of 100%. It should be noted that poles will season very slowly to below 23 pounds per cubic foot. The even-dry weight of cedar is 18.2 pounds per cubic foot.

NOTE - Preservative treatments may be applied when the poles are 75% seasoned; the creosote treatment is best applied at the 90% stage of seasoning.





Table 4.

WESTERN RED CEDAR.

Table 3 shows that the poles handled in these experiments arrived in Los Angeles from 1/5 to 1/2 seasoned. Since they took the zinc chloride treatment when 75% seasoned and the creosote treatment at 90% seasoned, the time they were fit for these treatments is apparent.

A study of the preceding tables shows that seasoning tables to have value must be based not on the time the poles are cut but upon the time of their arrival at the point where they will be seasoned. The foregoing figures furnish the basis of very close estimates of the seasoning progress of poles arriving in Los Angeles at any time and weighing about 33 # pounds per cubic foot at the time of arrival.

These estimates are furnished in Table 4.

# See Page 11.

Note - Poles should be seasoned to 28 pounds per cubic foot before treating with zinc chloride and to 25 pounds per cubic foot before creosoting.



Table 3 shows that the poles handled in these experiments arrived in Los Angeles from 1/5 to 1/2 seasoned. Since they took the zinc chloride treatment when 75% seasoned and the creosote treatment at 90% seasoned, the time they were fit for these treatments is apparent.

A study of the preceding tables shows that seasoning tables to have value must be based not on the time the poles are cut but upon the time of their arrival at the point where they will be seasoned. The foregoing figures furnish the basis of very close estimates of the seasoning progress of poles arriving in Los Angeles at any time and weigh about 55 # pounds per cubic foot at the time of arrival. These estimates are furnished in Table 4.

# See Page 11.



Table 4. This table gives the rate of seasoning of poles

WESTERN RED CEDAR.

ESTIMATES OF SEASONING STAGE #

BY MONTHS OF POLES

from

PUGET SOUND, WASHINGTON, ON THE 1st OF ANY MONTH

In Los Angeles, California.

Month Received in Los Angeles.

Number of months seasoned Oct. Nov. Dec. Jan. Feb. Mar. Apr. May June July Aug. Sept.

Wt. per cu.ft.

Wt.

Wt.

Wt.

Wt.

Wt.

Wt.

Wt.

Wt.

0	33	33	33	33	33	33	33	33	33
1	31.1	31	30.2	28.1	29	28.5	28	31	
2	30.0	29	27.4	26.0	26.5	26.3	26	29.3	
3	28.5	26.8	25.3	24.4	25.5	25.3	25.7	28	
4	26.5	25.1	23.8	23.7	24.9				
5	25.0	23.6	23.6						
6	23.5								

7 treating experiments gave these weights.

8 With this knowledge as a basis a table can be constructed

9 showing the date poles received at any time will be ready for

Note - Poles should be seasoned to 28 pounds per cubic foot before treating with zinc chloride and to 25 pounds per cubic foot before creosoting.



Note - Poles should be seasoned to 28 pounds per cubic foot before treating with zinc chloride and to 25 pounds per cubic foot before creosoting.

24

24

Number months seasoned	Oct. Nov. Dec. Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
Wt. per cu.ft.	Wt.	Wt.	Wt.	Wt.	Wt.	Wt.	Wt.	Wt.	Wt.
0	33	33	33	33	33	33	33	33	33
1	31.1	31	30.2	28.1	29	28.5	28	31	
2	30.0	29	27.4	26.0	26.2	26.3	26	29.3	
3	28.5	26.8	25.3	24.4	25.2	25.3	25.7	28	
4	26.2	25.1	23.8	23.7	24.9				
5	25.0	23.6	23.6						
6	23.2								
7									
8									
9									

Month Received in Los Angeles.

In Los Angeles, California.

POLE SOUND, WASHINGTON, ON THE 1st OF ANY MONTH  
from

BY MONTHS OF POLES

ESTIMATES OF SEASONING STAGE #

WESTERN RED CEDAR.

Table 4.



This table gives the rate of seasoning of poles arriving in Los Angeles at any time. It is immediately apparent that poles arriving during the fall and winter must be held longer for the same effect than those received in June or July. Further the exact time of holding poles for any seasoning stage or the seasoning stage of poles now held which arrived at a given time is apparent at a glance.

It is very desirable that poles to be held for preservation treatment or proper seasoning before setting should reach Los Angeles at that time which will result in the quickest seasoning. Table 4 shows that poles arriving from March to July inclusive season the most rapidly. These poles will be well seasoned after three months while shipments arriving from August to February will require from nine to six months for the same seasoning effect.

Poles are ready for the zinc chloride treatment when seasoned to about 28 pounds per cubic feet and they are in shape for the first class creosoting at 25 pounds per cubic foot. The treating experiments gave these weights.

With this knowledge as a basis a table can be constructed showing the date poles received at any time will be ready for treatment by either process. This information is presented in Table 5.

This table gives the rate of seasoning of poles arriving in Los Angeles at any time. It is immediately apparent that poles are seasoning during the fall and winter months, but longer for the same effect than those received in June or July. Further the exact time of holding poles for any seasoning stage or the seasoning stage of poles now held which arrived at a given time is apparent at a glance.

It is very desirable that poles be held for proper seasoning treatment or proper seasoning before setting should reach Los Angeles at that time which will result in the quickest seasoning. Table 4 shows that poles arriving from the to July inclusive season the most rapidly. These poles will be well seasoned after three months while shipments arriving from August to February will require from nine to six months for the same seasoning effect.

Poles are ready for the zinc chloride treatment when seasoned to about 35 pounds per cubic foot and they are in shape for the first class class of seasoning at 25 pounds per cubic foot. The treating experiments gave these weights:

With this knowledge as a basis a table can be constructed showing the date poles received at any time will be ready for treatment by either process. This information is presented in



Table 5.

## WESTERN RED CEDAR

## SEASONING - TREATMENT TABLE

## DURATION OF SEASONING BEFORE PRESERVATIVE TREATMENT.

Month of Arrival of Poles in Los Angeles	Tank-Creosote Method Poles at 24 to 25 Pounds per cubic foot		Tank-Zinc Chloride Method Poles at 26 to 28 pounds per cubic foot	
	Time required for Los Angeles seasoning months	Time poles are ready for treatment.	Time required for Los Angeles seasoning months.	Time poles are ready for treatment.
Jan.	5	June 1	3-1/2	April 15
Feb.	4	June 1	3	May 1
Mar.	3	June 1	2-1/2	May 15
Apr.	3	July 1	2	June 1
May	4	Sept. 1	2	July 1
June	4	Oct. 1	2	August 1
July	4	Nov. 1	2	Sept. 1
Aug.	8	Apr. 1	3	Nov. 1
Sept.	8	May 1	6	Mar. 1
Oct.	8	June 1	6	April 1
Nov.	7	June 1	5	April 1
Dec.	6	June 1	4	April 1
Average	5-1/3		3-1/2	

From above table the seasoning charge against preservative treatment may be estimated.



# WESTERN RED CEDAR

## SEASONING - TREATMENT TABLE

### DURATION OF SEASONING BEFORE PRESERVATIVE TREATMENT.

Tank-Crete Method Poles at 24 to 25 pounds per cubic foot	Time required for Los Angeles are ready for treat- ment.	Tank-Crete Method Poles at 24 to 25 pounds per cubic foot	Time required for Los Angeles are ready for treat- ment.
June 1	2-1/2	April 15	Time poles are ready for treat- ment.
June 1	3	May 1	Time poles are ready for treat- ment.
June 1	3-1/2	May 15	Time poles are ready for treat- ment.
July 1	3	June 1	Time poles are ready for treat- ment.
Sept. 1	4	July 1	Time poles are ready for treat- ment.
Oct. 1	4	August 1	Time poles are ready for treat- ment.
Nov. 1	4	Sept. 1	Time poles are ready for treat- ment.
Apr. 1	8	Nov. 1	Time poles are ready for treat- ment.
May 1	8	Mar. 1	Time poles are ready for treat- ment.
June 1	8	April 1	Time poles are ready for treat- ment.
June 1	9	April 1	Time poles are ready for treat- ment.
June 1	9	April 1	Time poles are ready for treat- ment.
7-1/2		3-1/2	

From above table the seasoning charge against preservative treatment may be estimated.



Shipments received from March to July need be held only two months before they are dry enough for the treatment with a solution of zinc chloride and a month or two months later they are fit for the oil treatment with creosote. Poles received in August can be treated with zinc chloride after 3 months but not with creosote until after 8 months.

Poles received from September to December inclusive will have to be held from 4 to 6 months for the zinc chloride treatment and from 6 to 8 months for the creosote oil treatment.

To secure a low seasoning charge against treatment only poles arriving in months for quick seasoning need be treated if that charge is too high. If shipments arriving at any and all months are treated the average time for seasoning is 3-1/2 months for zinc chloride and 5-1/3 months for creosote oil. These figures are the basis of the charge for seasoning in the estimates on page

#### SUMMARY OF SEASONING STATEMENTS.

The following statements summarize the preceding pages very briefly:

See very briefly:

The following statements summarize the preceding

#### SUMMARY OF SEASONING TESTIMONY.

Seasoning in the estimates on page

etc oil. These figures are the basis of the charge for

3-1/2 months for zinc chloride and 2-1/2 months for cre-

7 and all months are treated the average time for seasoning

ated if that charge is too high. If shipments arriving at

if poles arriving in months for quick seasoning need be

To secure a low seasoning charge against treatment

nt.

treatment and from 6 to 8 months for the creosote oil treat-

it have to be held from 4 to 6 months for zinc chloride

Poles received from September to December inclusive

months.

chloride after 5 months but not with creosote until after

creosote. Poles received in August can be treated with zinc

6 months later they are fit for the oil treatment with

treatment with a solution of zinc chloride and a month or

id only two months before they are dry enough for the

Shipments received from March to July need be



## THE PRESERVATIVE TREATMENT

1. The average cedar pole is about one-half seasoned upon arrival at Los Angeles.
2. The time required for the completion of seasoning varies from three to nine months according to the season of arrival of the poles in Los Angeles. (Table 4.)
3. Poles may be seasoned more rapidly by using skid poles on cross logs allowing a free movement of air underneath the poles (Page 1).
4. Large quantities of water are being handled in half seasoned poles (Table 2).
5. Seasoning preparation for preservative treatment varies from 2 to 8 months according to the season of the year. The periods are stated in Table 5.
6. Poles arriving in Los Angeles from March to July are ready for treatment with zinc chloride in two months and for creosote in one and two months more (Table 5).
7. The average time of seasoning poles received during all months of the year is 3-1/2 months for the zinc chloride treatment and 5-1/2 months for the treatment with creosote oil (Table 5).

Only the leading and successful results of the tests will be presented here.

\* This phase of the work is brought out more fully on pages 20 to 36 of the report.



1. The average cedar pole is about one-half seasoned

on arrival at Los Angeles.

2. The time required for the completion of seasoning varies from three to nine months according to the season

arrival of the poles in Los Angeles. (Table 4.)

3. Poles may be seasoned more rapidly by using alkali

on cross logs allowing a free movement of air under-

neath the poles (Page 1).

4. Large quantities of water are being handled in half-

seasoned poles (Table 2).

5. Seasoning preparation for preservative treatment

takes from 2 to 6 months according to the season of the year.

Periods are stated in Table 5.

6. Poles arriving in Los Angeles from March to July

are ready for treatment with zinc chloride in two months and

crossed in one and two months more (Table 5).

7. The average time of seasoning poles received dur-

ing all months of the year is  $3\frac{1}{2}$  months for the zinc

chloride treatment and  $5\frac{1}{2}$  months for the treatment with

arsenate oil (Table 5).



## THE PRESERVATIVE TREATMENT

Preservatives applied with a brush should be

applied as hot as possible. WESTERN RED CEDAR. even a day or two

Object of Treating Tests with Cedar.

The object of this line of experiments was to determine the absorption obtained with each preservative on

6 poles each, seasoned to 25 pounds per cubic foot average

1. What preservatives can be successfully applied to cedar.

2. What is the best method of application of each preservative.

3. What is the cost of each type of treatment.

4. What is the added life due to each treatment.

5. What is the annual service charge for poles under each type of treatment.

to protect the interior of season checks or deep splits

### Plan of Cedar Treating Experiments.

The plan of experiments and variation of processes tried will not be discussed here. #

Thoroughly seasoned cedar poles of the fall and

Each pole is branded with a number for the records.

The poles are kept under individual record during treatment and service in the pole line.

out of timber immersed. The penetrations varied from .2

Only the leading and successful results of the tests will be presented here.

corresponding to the ground line of the pole in service.

# This phase of the work is brought out more fully on pages 20 to 36 of the report on yellow pine. Similar experiments were tried with cedar.

# See also page 22 of Yel-16-Pine Report.

# THE PRESERVATIVE TREATMENT

OF

WESTERN RED CEDAR.

and of Treating Tests with Cedar.

The object of this line of experiments was to deter-

1. What preservative can be successfully applied to

2. What is the best method of application of each pre-

ervative.

3. What is the cost of each type of treatment.

4. What is the added life due to each treatment.

5. What is the annual service charge for poles under

type of treatment.

of Cedar Treating Experiments.

The plan of experiments and variation of processes tried

not be discussed here. #

Each pole is branded with a number for the records.

poles are kept under individual record during treatment

service in the pole line.

Only the leading and successful results of the tests

be presented here.

# This phase of the work is brought out more fully on  
a 20 to 50 of the report on yellow pine. Similar experi-  
ments were tried with cedar.



## Brush Treatments. #

Preservatives applied with a brush should be applied as hot as possible in two coats given a day or two apart. When seasoned to about 24 pounds per cubic foot cedar absorbs creosote oil or carbolineum used in this manner.

The absorption obtained with each preservative on 36 poles each, seasoned to 23 pounds per cubic foot average 1 lb. - 3 oz. per cubic foot of pole butt treated with carbolineum and 1 lb. - 8 oz. per cubic foot with creosote. Brush treatments should not be applied until the wood is seasoned to about 24 pounds per cubic foot.

The penetration secured by brush treating cedar is very light with either creosote or carbolineum and varies from 1/16 to 1/4 inch averaging about 1/8 of an inch. It is difficult to protect the interior of season checks or deep splits due to seasoning.

## Tank Treatments with Creosote Oil.

Thoroughly seasoned cedar poles of the fall and summer cut, treated after seasoning to 23 pounds per cubic foot, showed an average absorption of seven pounds per cubic foot of timber immersed. The penetrations varied from .2 inch to 1.5 inches and averaged .7 of an inch at a point corresponding to the ground line of the pole in service.

These figures are the average of these obtained by .

# See also page 22 of Yellow Pine Report.

Preservatives applied with a brush should be  
 applied as far as possible in two coats given a day or two  
 apart. When seasoned to about 24 pounds per cubic foot cedar  
 creosote oil or carbolineum used in this manner.  
 The absorption obtained with each preservative on  
 poles each, seasoned to 25 pounds per cubic foot average  
 1. - 3. 25. per cubic foot of pole butt treated with creosote-  
 um and 1. 25. - 3. 25. per cubic foot with carbolineum. Brush  
 treatments should not be applied until the wood is seasoned  
 about 24 pounds per cubic foot.

The penetration secured by brush treating cedar is  
 very slight with either creosote or carbolineum and varies from  
 1/4 to 1/2 inch averaging about 1/3 of an inch. It is difficult  
 to protect the interior of season checks or deep splits  
 to seasoning.

# Treatments with Creosote Oil.

Thoroughly seasoned cedar poles of the fall and  
 winter cut, treated after seasoning to 25 pounds per cubic  
 foot, showed an average absorption of seven pounds per cubic  
 foot of timber immersed. The penetrations varied from 2  
 to 1.5 inches and averaged .7 of an inch at a point  
 corresponding to the ground line of the pole in service.  
 These figures are the average of those obtained by



treating 126 poles in a single bath of creosote heated to 200° F. to 225° F. for from two to six hours and then allowing the poles to cool in the oil until the following morning, making a total time of treatment including handling of 24 hours or one run per day.

There is no difference in the absorption of summer-cut and fall-cut poles as in the case of yellow pine. One reason for this fact is that cedar is nearly all heartwood except an outer band from 1/2 to 1-1/2 inches thick which is sapwood. The heartwood cannot be penetrated by this process but the narrow sapwood band of well seasoned poles can be completely filled with oil irrespective of the season of cutting.

When the heartwood is protected by a band of sapwood filled with creosote oil the pole is exceedingly decay resistant.

In order to reduce the time of treatment experiments on fall cut poles seasoned to 23 pounds were tried with hot and cold tanks of oil. The poles were heated from three to six hours in the hot bath and then plunged into the cold bath for a limited period. The results are tabulated below:

ting 126 poles in a single bath of acetone heated to 200°  
to 225° F. for from two to six hours and then allowing the  
to cool in the oil until the following morning, making  
total time of treatment including handling of 24 hours or one  
per day.

There is no difference in the absorption of cambric  
tail-cut poles as in the case of yellow pine. One reason  
this fact is that cedar is nearly all heartwood except  
outer band from  $1\frac{1}{2}$  to  $1\frac{1}{2}$  inches thick which is sapwood.  
heartwood cannot be penetrated by this process but the  
sapwood band of well seasoned poles can be completely  
ed with oil irrespective of the season of cutting.  
When the heartwood is protected by a band of sapwood  
ed with acetone oil the pole is exceedingly decay

stant.  
in order to reduce the time of treatment experiments  
all cut poles seasoned to 25 pounds were fired with hot and  
tanks of oil. The poles were heated from three to six  
a in the hot bath and then plunged into the cold bath for  
mixed period. The results are tabulated below:



Table 6.

# WESTERN RED CEDAR

## ABSORPTION OF CREOSOTE

POLES SEASONED TO 23 POUNDS PER CUBIC FOOT.

No. Poles averaged	Total	Hours of treatment - Hot Bath	Cold Bath	Absorption per Cubic Foot	Penetration Inches
8	3	2	1	3.3	.48
4	4	3	1	2.5	.35
4	4	2	2	2.9	.39
6	5	4	1	3.8	.45
4	6	4	2	3.8	.50
126	18	Hot bath cooling to air temperature		7.0	.7

Short runs can apparently be made with success.

From the tabulation it can not be said what period can best be used in practice, but it is safe to say that a six hour run will result in an absorption of 3.8 pounds per cubic foot and a penetration of 1/2 inch.

Winter cut poles treated with creosote after seasoning to 25-1/2 pounds per cubic foot could not be well treated in short runs. Seven hours in the hot bath followed by 1/2 hour in the cold bath gave an average absorption of but 1.6 pounds of oil per cubic foot and a penetration of 1/8 inch. These poles were best treated



# WESTERN RED CEDAR

## ABSORPTION OF CREOSOTE

POLES SEASONED TO 25 POUNDS PER CUBIC FOOT.

Penetration Inches	Absorption per Cubic Foot	Hours of treatment Cold Bath	Total - Hot Bath	Notes
.48	3.3	1	2	
.55	3.5	1	3	
.59	3.9	2	2	
.45	3.8	1	4	
.50	3.8	2	4	
.7	7.0	Hot bath cooling to air temperature		18

Short runs can apparently be made with success. The tabulation is can not be said what period can best be in practice, but it is safe to say that a six hour will result in an absorption of 3.8 pounds per cubic and a penetration of  $1\frac{1}{2}$  inch.

Winter cut poles treated with creosote after being to 25-1 $\frac{1}{2}$  pounds per cubic foot could not be well in short runs. Seven hours in the hot bath was by 1 $\frac{1}{2}$  hour in the cold bath gave an average absorption of but 1.6 pounds of oil per cubic foot and a penetration of  $1\frac{1}{8}$  inch. These poles were best treated



by holding in a hot bath about three hours, cooling two hours, reheating two hours and then allowing the poles to cool in the oil overnight. The oil absorbed in the first heating and cooling aids in the second heating and cooling. Upon 22 poles this treatment resulted in an average absorption of 4.4 pounds of oil per cubic foot and a penetration of  $1\frac{1}{3}$  inch.

Two and three hours heating and allowing the poles to stand overnight resulted in 3 pounds absorption and  $1\frac{1}{4}$ " penetration. It can be readily seen that poles at 25- $1\frac{1}{2}$  pounds absorb about  $1\frac{1}{2}$  as much oil as when they are seasoned to 23 pounds. Further the treatment in the latter case is much shorter.

Experiments with the spring-cut poles proved that poles seasoned to 28 pounds only cannot be successfully creosoted.

A few old dry poles from a pile in the Pacific Electric Company's yards were treated to show the possibilities with thoroughly seasoned poles. The results follows

Treatment		Absorption per cu. ft.	Penetration Inches.
Hot Bath Hours	Cold Bath Hours		
4	0	$2\frac{2}{3}$	$1\frac{1}{8}$
3	20 minutes	3	$5\frac{1}{8}$
5	5 "	4	$5\frac{1}{8}$
1	1	7	$3\frac{3}{4}$
2	1	5	$3\frac{3}{4}$
3	1	5	$3\frac{3}{4}$



being in a hot bath about three hours, cooling two hours,  
 then two hours and then allowing the poles to cool in  
 the overnight. The oil absorbed in the first heating and  
 cooling side in the second heating and cooling. Upon 22 poles  
 treatment resulted in an average absorption of 4.4  
 of oil per cubic foot and a penetration of 1/8 inch.  
 Two and three hours heating and allowing the poles  
 and overnight resulted in 5 pounds absorption and 1/4"  
 penetration. It can be readily seen that poles at 25-1/2  
 absorb about 1/2 as much oil as when they are seasoned  
 pounds. Further the treatment in the latter case is  
 shorter.

Experiments with the spring-cut poles proved that  
 seasoned to 28 pounds only cannot be successfully  
 coated.  
 A few old dry poles from a pile in the Pacific Elec-  
 Company's yards were treated to show the possibilities  
 thoroughly seasoned poles. The results follow:

Treatment of Bath Hours	Cold Bath Hours	Absorption per cu. ft.	Penetration Inches.
4	0	2.5	1/8
3	20 minutes	2.5	1/8
2	1	2.5	1/8
1	1	2.5	1/8
1	1	2.5	1/8
1	1	2.5	1/8
1	1	2.5	1/8
1	1	2.5	1/8
1	1	2.5	1/8
1	1	2.5	1/8



The important conclusions are:

1. Poles should be seasoned to 25 pounds per cubic foot before creosoting. Better results are secured after seasoning to 25 pounds per cubic foot.

2. The time required for creosoting timber seasoned to 25 pounds per cubic foot will vary from seven to 24 hours according to the result desired. Two runs per day per tank can be made, one giving an absorption of 1-1/2 pounds per cubic foot and the second an absorption of 3 pounds or one daily run may be made with an absorption of 4-1/2 pounds per cubic foot. As the poles become dryer the absorptions increase.

3. The best absorption and penetration is secured when the poles are seasoned to a weight of 25 pounds per cubic foot. At this stage the sapwood can be completely filled with creosote oil with about 5 gallons of oil per average pole.

4. Poles seasoned to 25 pounds per cubic foot may be creosoted in six hours and less with an absorption of 3.5 pounds per cubic foot and a penetration of 1/2 inch. This amounts to about 3 gallons of oil per pole.

5. The sapwood of cedar poles seasoned to 25 pounds can be completely filled in a 24-hour single bath treatment with an absorption of seven pounds per cubic foot or approximately 5 gallons of oil per pole.

Tank Treatments with Crude Petroleum.

Cedar cannot be successfully impregnated with crude oil in an open tank. Even with thoroughly seasoned poles





The important conclusions are:

1. Poles should be seasoned to 25 pounds per cubic foot before creosoting. Better results are secured after seasoning to 23 pounds per cubic foot.

2. The time required for creosoting timber seasoned to 25 pounds per cubic foot will vary from seven to 24 hours according to the result desired. Two runs per day per tank can be made, one giving an absorption of 1-1/2 pounds per cubic feet and the second an absorption of 3 pounds or one daily run may be made with an absorption of 4-1/2 pounds per cubic foot. As the poles become dryer the absorptions increase.

3. The best absorption and penetration is secured when the poles are seasoned to a weight of 23 pounds per cubic foot. At this stage the sapwood can be completely filled with creosote oil with about 5 gallons of oil per average pole.

4. Poles seasoned to 23 pounds per cubic foot may be creosoted in six hours and less with an absorption of 3.8 pounds per cubic foot and a penetration of 1/2 inch. This amounts to about 3 gallons of oil per pole.

5. The sapwood of cedar poles seasoned to 23 pounds can be completely filled in a 24-hour single bath treatment with an absorption of seven pounds per cubic foot or approximately 5 gallons of oil per pole.

#### Tank Treatments with Crude Petroleum.

Cedar cannot be successfully impregnated with crude oil in an open tank. Even with thoroughly seasoned poles

Odear cannot be successfully impregnated with crude  
oil. Even with thoroughly seasoned poles  
trees treated with crude petroleum.

5 gallons of oil per pole.  
an absorption of seven pounds per cubic foot or approx-  
imately 70% in a 24-hour single bath treatment  
be completely filled in a 24-hour single bath treatment  
The exposed of cedar poles seasoned to 25 pounds  
per cubic foot to about 2 gallons of oil per pole.

per cubic foot and a penetration of 1 1/2 inches. This  
is in six hours and less with an absorption of 5.5

4. Poles seasoned to 25 pounds per cubic foot may be  
seasoned all with about 2 gallons of oil per average pole.

At this stage the exposed can be completely filled  
the poles are seasoned to a weight of 25 pounds per cubic

3. The best absorption and penetration is secured  
As the poles become drier the absorption increases.

may be made with an absorption of 4-1/2 pounds per cubic  
foot and the second absorption of 5 pounds or one daily

be made, one giving an absorption of 1-1/2 pounds per  
cubic foot. The time per day per tank

5 pounds per cubic foot will vary from seven to 24 hours  
2. The time required for seasoning timber seasoned

to 25 pounds per cubic foot.

1. Poles should be seasoned to 25 pounds per cubic  
foot. The important consideration is:



ut slight absorptions and penetrations can be obtained -  
arely more than a coating of oil.

ank Treatments with Zinc Chloride.

Treatments upon the partially seasoned poles of the  
pring-cut with a water solution of zinc chloride prove  
hat 3 pounds of solution per cubic foot can be forced into  
oles seasoned only to 31 pounds weight per cubic foot. This  
equired a 24-hour treatment consisting of heating several  
ours at 210° F. and allowing the poles to cool in the solution  
overnight.

Poles seasoned to 25 pounds per cubic foot absorbed  
bout 4 pounds of 7% solution per cubic foot in short runs  
onsisting of 2 hours in each bath or a total of four hours.  
ne hundred and three poles seasoned to 23 pounds per cubic  
oot treated in a zinc chloride solution heated to 210° F. for  
ne to four hours and allowed to cool averaged an absorption  
f 4 pounds per cubic foot. This treatment is unnecessarily  
ong for poles so well seasoned. The same results apparently  
an be obtained in four hours by hot and cold baths. In these  
reatments the strength of the solution varied from 3% to 10%.

The conclusions for this preservative are

1. Greener poles may be treated with zinc chloride  
olution than with creosote oil. Poles seasoned only to 31  
ounds per cubic foot will absorb 3 pounds of solution per

slight absorptions and perturbations can be obtained =

ly more than a coating of oil.

Treatments with Zinc Chloride.

Treatments upon the partially annealed poles of the

ny-cut with a water solution of zinc chloride prove

5 pounds of solution per cubic foot can be forced into

a seasoned only to 51 pounds weight per cubic foot. This

is a 24-hour treatment consisting of heating several

at 210° F. and allowing the poles to cool in the solution

night.

Poles seasoned to 52 pounds per cubic foot absorbed

4 pounds of 5% solution per cubic foot in about 10

of 5 hours in each bath of a total of four hours.

undried and three poles seasoned to 52 pounds per cubic

treated in a zinc chloride solution heated to 210° F. for

a four hour and allowed to cool averaged an absorption

pounds per cubic foot. This treatment is unnecessary

for poles as well seasoned. The same result is obtained

obtained in four hours by hot and cold baths. In these

ments the strength of the solution varied from 5% to 10%.

The conclusions for this treatment are:

I. Greener poles may be treated with zinc chloride

than with arsenic oil. Poles seasoned only to 51

a per cubic foot with about 5 pounds of solution per



cubic foot in a 24 hour treatment, per cubic foot.

2. The strength of the treatment can be controlled by the amount of the zinc chloride in solution. One-half pound of the pure chloride for each cubic foot of timber immersed is sufficient.

3. Poles seasoned to 25 pounds per cubic foot and below can be quickly treated in four hours with 4 pounds of solution.

Tank Treatments with Creosote and Zinc Chloride. #

This treatment should be used only on poles seasoned to at least 25 pounds per cubic foot. At this stage poles held in a bath of creosote oil at 212° F. for one hour or more and then plunged into a solution of zinc chloride will absorb about  $\frac{2}{3}$  of a pound of creosote per cubic foot in the hot bath and  $\frac{3-1}{3}$  pounds of solution in the cold bath.

Twelve zinc treated poles which had evaporated the water of the solution were brush treated with creosote absorbing about  $\frac{1}{2}$  pound of oil per cubic foot in two coats.

Poles freshly treated in a zinc solution will not absorb creosote upon being brush treated or plunged into a tank of the oil.

# See page 35 of the Report on Yellow Pine Treatments

1 foot in a 24 hour treatment, per cubic foot.  
 2. The strength of the treatment can be controlled  
 the amount of the zinc chloride in solution. One-half  
 of the pure chloride for each cubic foot of timber  
 treated is sufficient.

3. Poles seasoned to 25 pounds per cubic foot and  
 can be quickly treated in four hours with 4 pounds of  
 zinc chloride.

4. Treatments with creosote and zinc chloride.

This treatment should be used only on poles seasoned  
 at least 25 pounds per cubic foot. At this stage poles will  
 bath of creosote oil at 210° F. for one hour or more and  
 be plunged into a solution of zinc chloride with a spray  
 at 210° of a pound of creosote per cubic foot in the hot bath.  
 5-15 pounds of solution in the cold bath.  
 Twelve runs treated poles which had evaporated the  
 oil of the solution were again treated with creosote spraying  
 at 175° of oil per cubic foot in two coats.  
 Poles treated in a zinc solution will not  
 be creosoted when they are plunged or sprayed into a  
 bath of the oil.

\* See page 25 of the Report on Kailash Pine Treatment



## Handling Poles During Treatments.

The methods and comparative costs of handling poles are discussed on pages 37 to 40 of the report upon western yellow pine.

The maximum cost of handling poles is there shown to be \$.35 per pole.

### Seasoning Charges.

### Monthly Charge Per Pole.

Seasoning 400 poles per acre land charge at \$10 per acre per year	.002
--	------

Supervision of yard at \$30 per month	
Seasoning 2000 poles on an average	.015

Interest on value of pole \$7.00 at 5%	<u>.03</u>
	.047

Since the charge for supervision would doubtless be reduced by division with the treating plant pole shaving, and painting apportionments poles should be seasoned for less than \$.05 each per month.

The question of how much longer poles must be held for preservative treatment than they would otherwise be held depends upon the practice in each yard. It is safe to say that poles are held on an average at least one month in any yard for shaving and painting. Taking this minimum holding period as the average seasoning period when poles are not treated, they must be held on the average 2-1/2 months longer before

Handling Poles During Treatment.

The methods and comparative costs of handling poles are discussed on pages 37 to 40 of the report upon western yellow pine.

The maximum cost of handling poles as there shown to

\$3.55 per pole.

Seasoning Charges.

Seasoning 400 poles per acre  
land charge at \$10 per acre  
per year

.002

Supervision of yard at \$50 per

.015

Seasoning 2000 poles on an average

Interest on value of pole \$7.00

.08

.047

Since the charge for supervision would doubtless be reduced by division with the treating plant pole shaving, and painting appointments poles should be seasoned for less

an \$1.05 each per month.

The question of how much longer poles must be held

in preservative treatment than they would otherwise be held

depends upon the practice in each yard. It is safe to say that

less are held on an average at least one month in any yard.

Shaving and painting. Taking this minimum holding period

the average seasoning period when poles are not treated,

it must be held on the average 2-1/2 months longer before



treatments can begin with zinc chloride and 4 months before creosoting is practicable. #

Since the poles can then be treated at the rate of a carload or more per day, they may be considered available as soon as seasoned to the degree for treatment. This is the average charge for all seasons. Poles received during fall and winter must be seasoned longer while those received in spring and summer require less seasoning.

If creosote only is used the maximum charge for seasoning would be that of four months or \$.20 at a maximum. But if zinc chloride is used except when poles are fit for creosote treatment the average charge would be but that of 2-1/2 months seasoning or \$.12-1/2 per pole. If cheap land is used the poles can be seasoned for the additional time for about the interest on the money invested in the poles or \$.03 per month. The charge for 2-1/2 months then is \$.07-1/2.

#### Cost of Treating Cedar Poles.

The cost of treating cedar poles exclusive of the cost of the preservatives is estimated as follows:

# See Table 5 on Page 13.



treatments can begin with zinc chloride and 4 months before  
croscote is practicable. #

Since the poles can then be treated at the rate of a  
carload or more per day, they may be considered available as  
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months seasoning or \$.12-1/2 per pole. If cheap land is  
used the poles can be seasoned for the additional time for  
about the interest on the money invested in the poles or  
\$.05 per month. The charge for 2-1/2 months then is  
\$.07-1/2.

Cost of Treating Cedar Poles.

The cost of treating cedar poles exclusive of  
the cost of the preservatives is estimated as follows:

# See Table 5 on Page 15.



Handling poles to and from treating skids			.055
Handling poles through treating tanks #			.128
Land rent chargeable to plant	\$5.00 per year		
Depreciation of plant 10%	400.00	" "	
Interest on installation \$4000 at			
5%	200.00	" "	
The cost of preservatives is taken as follows:			
Interest on capital in oil,			
15,000 gallons at 20¢, Interest			
5%	150.00	" "	
	<u>755.00</u>		
Yearly capacity 36,000 poles,			
Charge per pole	\$ .02		
If only 5,000 poles handled			
per year, charge per pole	.151	\$0.02 to .151	
Seasoning charge		<u>.075 to .125</u>	
Total seasoning and handling charge per pole			.278 to .459

Taking the foregoing estimates as a basis, the total cost of treating cedar poles, including preliminary seasoning is as tabulated below. Every estimate in the table

# See Page 38 of Yellow Pine Report.



\* See Page 58 of Yellow Pine Report.

ing is as tabulated below. Every estimate in the table cost of treating cedar poles, including preliminary season- Taking the foregoing estimates as a basis, the total

Total seasoning and handling charge per pole .278 to .479

Seasoning charge .075 to .125

per year, charge per pole .151 If only 5,000 poles handled

Charge per pole .151

Yearly capacity 50,000 poles,

15,000 gallons at 20¢, Interest 150.00

Interest on capital in oil,

Interest on installation \$4000 at 200.00

Depreciation of plant 10% 400.00

Land rent chargeable to plant 67.00 per year

Handling poles through treating tanks #

Handling poles to and from treating skids



# WESTERN RED CEDAR

## COMPARATIVE COSTS OF TREATMENT

Standard 40' - 8" pole weighing  
800 pounds, Treating  
6-1/4 cubic feet.

is very liberal as may be seen by tracing back its derivation.

The cost of preservatives is taken as follows:

	Per Foot	Per pole	Per pole	Season-Hand- charge	Hand- charge	Total cost of Treat- ment
Creosoted oil				\$0.20	per gallon	
Carbolineum				.60	" "	
Zinc Chloride				.05	per pound	
Brush						
Creosote	1.5	9.375	.21	.10	.30	
On page 40 of the report upon yellow pine, the						
latest quotations of these preservatives are given.						
Creosote	.5	3.12	.19	.10	.39	
Creosote and Tank	.68	4.16	.24	.10	.52	
Creosote and Zinc Chloride	.5	3.12	.19	.10	.39	
Creosote and Tank	.5	3.12	.19	.10	.39	
Creosote and Zinc Chloride	.5	3.12	.19	.10	.39	
Creosote Tank	1.5	9.37	.31	.10	.55	
Creosote Tank	3.0	18.75	.64	.10	.55	
Creosote Tank	3.8	23.75	.86	.10	.55	
Creosote Tank	4.5	28.12	.96	.10	.55	
Creosote Tank	7.0	45.75	1.03	.10	.55	

is very liberal as may be seen by tracing back its derivation.  
The cost of preservatives is taken as follows:

Creosoted oil	0.20 per gallon
Carbolineum	0.60 " "
Zinc Chloride	0.05 per pound

On page 40 of the report upon yellow pine, the latest quotations of these preservatives are given.



# WESTERN RED CEDAR

## COMPARATIVE COSTS OF TREATMENT

LOS ANGELES, CALIFORNIA, 1909. #

Standard 40' - 8" pole weighing  
800 pounds, Treating  
6-1/4 cubic feet.

Preserva- vative	Appli- cation	Per cubic foot	Per pole	Per pole	Season- ing	Hand- ling	Total cost of Treating Pole
		Pounds	Pounds	Cents	charge	charge	
Creosote	Brush	1.5	9.375	.21	.10	.10	.41
Carbolin- eum	Brush	1	6.25	.11	.10	.10	.61
Zinc Chloride	Tank	.5	3.12	.19	.10	.35	.64
Creosote and Zinc Chlo- ride	Tank	.66	4.16	.097	.10	.35	.74
Creosote and Zinc Chlo- ride	Tank	.5	3.12	.19	.10	.35	.85
Creosote and Zinc Chlo- ride	Brush	.5	3.12	.19	.10	.35	.85
Creosote	Tank	1.5	9.37	.21	.10	.35	.60
Creosote	Tank	3.0	18.75	.44	.10	.35	.89
Creosote	Tank	3.8	23.75	.56	.10	.35	1.01
Creosote	Tank	4.5	28.12	.66	.10	.35	1.11
Creosote	Tank	7.0	43.75	1.03	.10	.35	1.46

COMPARATIVE COSTS OF TREATMENT

WILSON, J. H. 1911

Standard 401 - 3" pole weighing  
800 pounds, Texas  
6-1/4 cubic feet



# WESTERN RED CEDAR

## ESTIMATED ANNUAL SERVICE CHARGE 40' - 8" POLES

LOS ANGELES, CALIFORNIA, 1909. #

Treatment	Cost of poles erected	Estimated average life	Equivalent annual charge at 5%	Added average life necessary to pay for cost of treatment Years.
Seasoned 1 month	11.83	10	1.53	
Seasoned 6 months	11.98	10	1.55	1/3
Creosote Brush	12.21	12	1.36	1/2
Carbolineum Brush	12.41	12	1.38	2/3
Zinc chloride Tank	12.44	16	1.15	2/3
Creosote and zinc chloride, Tank	12.54	18	1.07	3/4
Creosote and zinc chloride tank and brush	12.64	17	1.11	1
Creosote 1.5 lbs. tank	12.49	14	1.26	2/3
3.0 " "	12.69	18	1.08	1
3.8 " "	12.81	18	1.09	1-1/4
4.5 " "	12.91	18	1.10	1-1/3
7.0 " "	13.28	24	.96	1-1/2

#	Cost of Pole in Los Angeles yard	\$6.50	
	Shaving	.50	
	Painting	.80	
	Framing	.25	
	Hauling	.75	
	Erecting	2.00	
	Supervision 10%	1.00	\$11.8
	Seasoning per month	.03	



WESTERN RED CEDAR  
ESTIMATED ANNUAL SERVICE CHARGE 40' - 8" POLES  
LOS ANGELES, CALIFORNIA, 1902. #

ment	Cost of poles erected	Estimated average life	Estimated annual charge at 5%	Added average life necessary to pay for cost of treatment in Years.
oned 1 month	11:83	10	1:35	
oned 6 months	11:98	10	1:35	1 1/2
note Bresh	12:21	12	1:36	1 1/2
olineum Bresh	12:41	12	1:38	2 1/2
Chloride Tank	12:44	16	1:15	2 1/2
note and zinc chloride Tank	12:54	18	1:07	3 1/4
note and zinc oxide tank and	12:64	17	1:11	1
note 1:2 lbs: tank	12:49	14	1:26	2 1/2
3:0 " "	12:69	18	1:08	1
3:8 " "	12:81	18	1:09	1-1/4
4:5 " "	12:91	18	1:10	1-1/2
7:0 " "	13:28	24	:96	1-1/2

# Cost of Pole in Los Angeles yard  
Shaving  
Painting  
Trimming  
Hauling  
Erecting  
Supervision 10%  
Seasoning per month

00:40  
00:50  
00:60  
00:75  
00:85  
00:95  
01:00  
01:05



Table 8 shows the actual cost, erected, of poles under each type of treatment, the present annual service charge of untreated poles, estimated charges for treated poles and the added life necessary in treated poles to pay for treatment. Life beyond that required to pay for treatment is clear gain.

#### Application of the Results.

The desirability of seasoning and treating timber depends finally upon a comparison of actual costs. Table 8 presents this comparison for cedar poles in Los Angeles.

The following statements sum up the situation:

1. It now costs \$1.53 per year to maintain an untreated 40' - 8" pole in line in Los Angeles, California.
2. If the zinc chloride treatment adds but  $2/3$  of a year to the life of a pole and if the most expensive creosote treatment adds but  $1-1/2$  years to the life of the pole, the annual charge of \$1.53 is not increased.
3. Any further added life due to the treatment is clear gain.
4. There is no question but that each treatment will add years to the pole life instead of fractions of years.
5. The only conclusions open is that treating pays.

Table 8 shows the actual cost, erected, of poles

under each type of treatment, the present annual service charge of untreated poles, estimated charges for treated poles and the added life necessary in treated poles to pay for treatment. Life beyond that required to pay for treatment is clear gain.

#### Application of the Results.

The desirability of seasoning and treating timber depends finally upon a comparison of actual costs. Table 8 presents this comparison for cedar poles in Los Angeles.

The following statements sum up the situation:

1. It now costs \$1.75 per year to maintain an untreated 40' - 8" pole in line in Los Angeles, California.
2. If the zinc chloride treatment adds but 25% of a year to the life of a pole and if the most expensive creosote treatment adds but 1-1/2 years to the life of the pole, the annual charge of \$1.75 is not increased.
3. Any further added life due to the treatment is clear gain.
4. There is no question but that each treatment will add years to the pole life instead of fractions of years.



The amount gained by treating of course depends upon the life of the pole as actually determined. Railroads in this country are increasing the life of their ties from four to eight years by zinc chloride treatments, and adding up to ten years by creosote treatments.

If the zinc chloride treatment increases the life of cedar six years an annual charge of \$1.50 per pole for six years is saved. If creosoting increases the life of a pole from eight to ten years an annual charge of \$1.50 per pole for eight to ten years is saved.

Therefore even though the estimated increased life is placed as low as two years for the most expensive treatment, there is still a substantial gain for a solid creosote treatment of 7 pounds of oil per cubic foot filling all parts of the sapwood pays for itself in one and one-half years of added life. According to past experience a treatment of that nature should add at least 10 years to the average life of poles.

Designs for a commercial pole treating plant accompany this report. They are discussed on page 38 of the report upon the "Seasoning and Preservative Treatment of Western Yellow Pine."

report upon the "Reasoning and Preservative Treatment of

company this report. They are discussed on page 58 of the

Reasons for a commercial pine treating plant

1. prices.

that nature should add at least 10 years to the average life

which life. According to past experience a treatment of

the wood pays for itself in one and one-half years of

and of 7 pounds of oil per cubic foot filling all parts of

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Therefore even though the estimated increased life

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is saved. It proceeds increases the life of a pole

to cedar six years an annual charge of \$1.50 per pole for six

If the zinc chloride treatment increases the life

years by creosote treatments.

light years by zinc chloride treatments, and adding up to ten

its country are increasing the life of their trees from four to

the life of the poles as actually determined. Results in

The amount gained by treating of creosote depends upon



## Recommendations.

The facts brought out in this study and the foregoing estimates afford the basis of the following recommendations:

1. All poles should be seasoned to 25 pounds per cubic foot before setting in the soil whether they are to be treated or not. Unseasoned sapwood decays sooner than seasoned sapwood. The cost of seasoning a pole five months instead of one month would amount to less than \$.25 per pole. An added life of a fraction of a year pays for this charge.

2. Skidways should be raised slightly on cross logs to allow free circulation of air underneath poles and to insure better seasoning in a given period.

3. If possible arrangements should be made to have poles seasoned in the woods before shipment as they have a value of but \$.02 per running foot at that time or less than \$1.00 per pole. #

# - Stumpage Granite Falls, Washington	\$.40 per 40 foot pole
Cutting and peeling	.40 " " " "
On car logging railroad, Granite Falls	1.80
Freight to Everett Washington	
\$18 per car, switching \$6 \$24	.30
Value in water at Everett, Wash.	\$3.20
Water Freight to Los Angeles \$7 per M B M or about	\$3.30 per pole.
Value at Redondo, Calif.	\$6.50

..arctic islands..

The above mentioned was the subject of the

overlying estimates filed the basis of the following reasons:

1100

year days for the charge.

than 1.25 per pole. Added life of a fraction of a  
live minutes instead of one hour would amount to less  
than assessed amount. The cost of assessing a pole  
to be treated or not. Unassessed poles decay sooner  
than those before setting in the soil whether they are  
5. All poles should be assessed to 25 pounds per

and to insure better seasoning in a given period.

than \$1.00 per pole. #

- Stumpage Granite Talia, Washington \$ .40 per sq foot  
" " " " " " .40  
" " " " " " .40

attling and peeling  
a car loading rail road, Granite  
Talia  
freight to Everett Washington  
18 per cent, availing \$ .64  
also in water at Everett, Wash.  
after Freight to Los Angeles \$7 per cu yd or about \$3.50 per  
cu yd.

also at Redondo, Calif. \$6.75



4. It is recommended that poles be seasoned to 24 pounds per cubic foot and then tank-creosoted.

5. If this is considered impracticable at present it is recommended that as poles season (at 23 pounds) treatments should begin first with zinc chloride and after poles are drier (at 25 pounds) creosote should be used. The estimates given are based on this plan.

6. In case zinc  $\phi$  treated poles remain in the yard after treatment until very dry, they should be further treated by a heavy application of hot creosote with a brush. This will further increase their life.

7. If tank treatments cannot be given brush treatments of creosote or carbolineum should be applied only to well seasoned poles (24 pounds.)

4. It is recommended that poles be seasoned to 24 cubic feet and then tank-creosoted.
5. If this is considered impracticable, present it is recommended that as poles season (at 28 pounds) treatments should begin first with zinc chloride and after poles dry (at 25 pounds) creosote should be used. The estimates are based on this plan.
6. In case zinc & treated poles remain in the yard or treatment until very dry, they should be further treated by a heavy application of hot creosote with a brush. This will further increase their life.
7. If tank treatments cannot be given brush treatments of creosote or carbolineum should be applied only to seasoned poles (24 pounds).

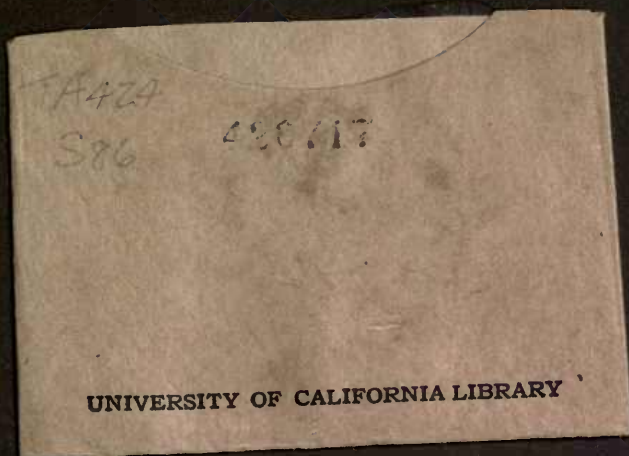












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